

PANEL SESSION IV:
NATIONAL LABORATORIES R&D



**sCO₂ – SODIUM
HEAT EXCHANGER
INTEGRITY**

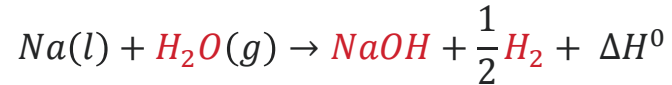


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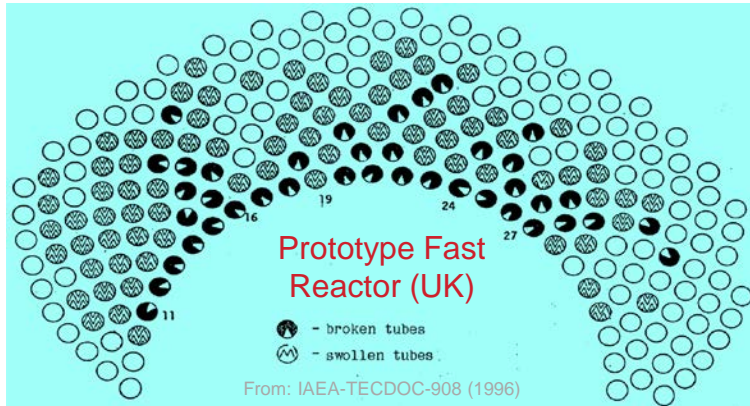
Thursday March 31, 2016
San Antonio Texas

HX FAILURES IN SODIUM FAST REACTORS

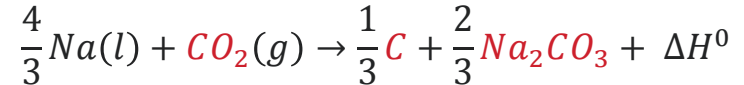
STEAM GENERATORS (Na-H₂O)



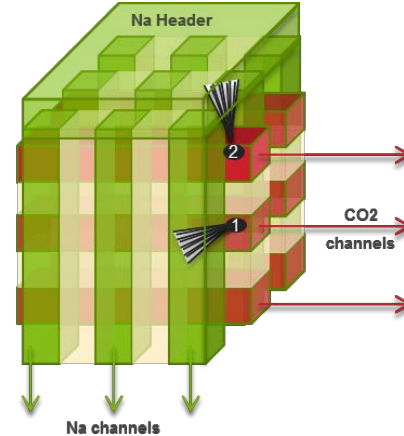
- Hydrogen production needs to be handled
- Wastage in shell & tube HX



Na-CO₂ HX

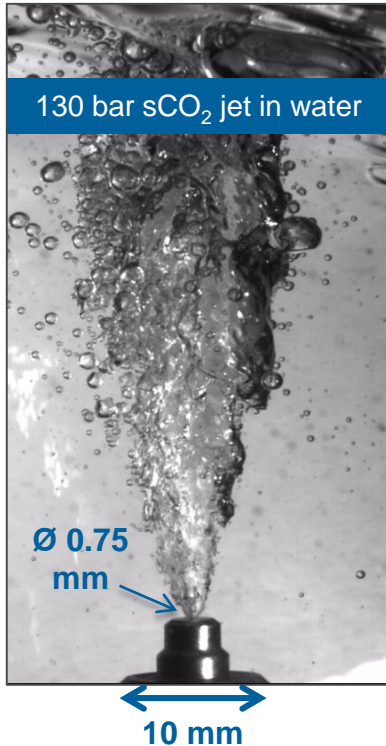


- Solids production issue & cleaning
- Failure mechanism of diffusion bonded HX



FAILURE IN sCO₂ – SODIUM HEAT EXCHANGER

Jet experiments



Findings

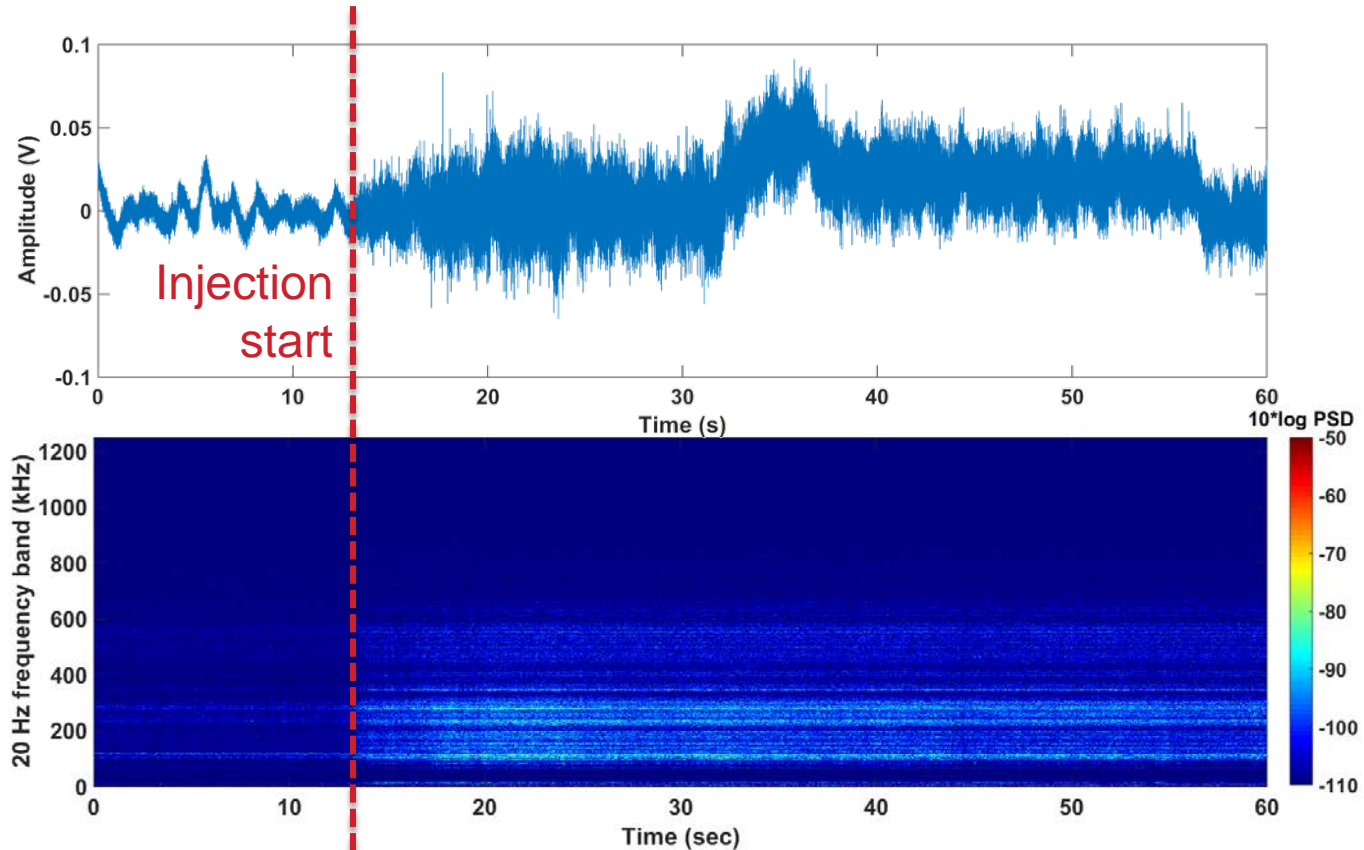


- sCO₂-Na reaction converts gas jet into solids (NaCO₃, C, NaO₂)
- Exothermic
- sCO₂ failure << steam failure

Remaining questions

- Failure mechanisms of diffusion-bonded HX
- Failure modes
- Differences between HX types
- Isolation
- Cleaning, inspecting, and recertifying
- **Leak detection**

PASSIVE ACOUSTIC LEAK DETECTION



THANKS

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